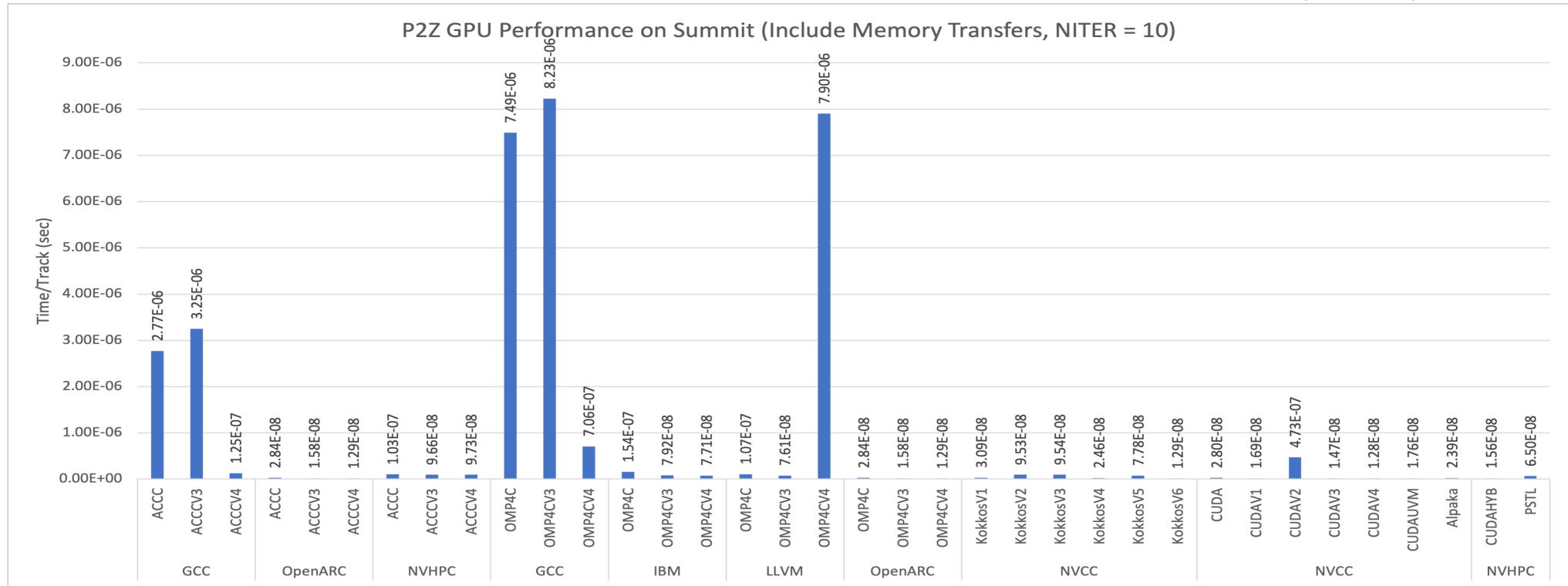
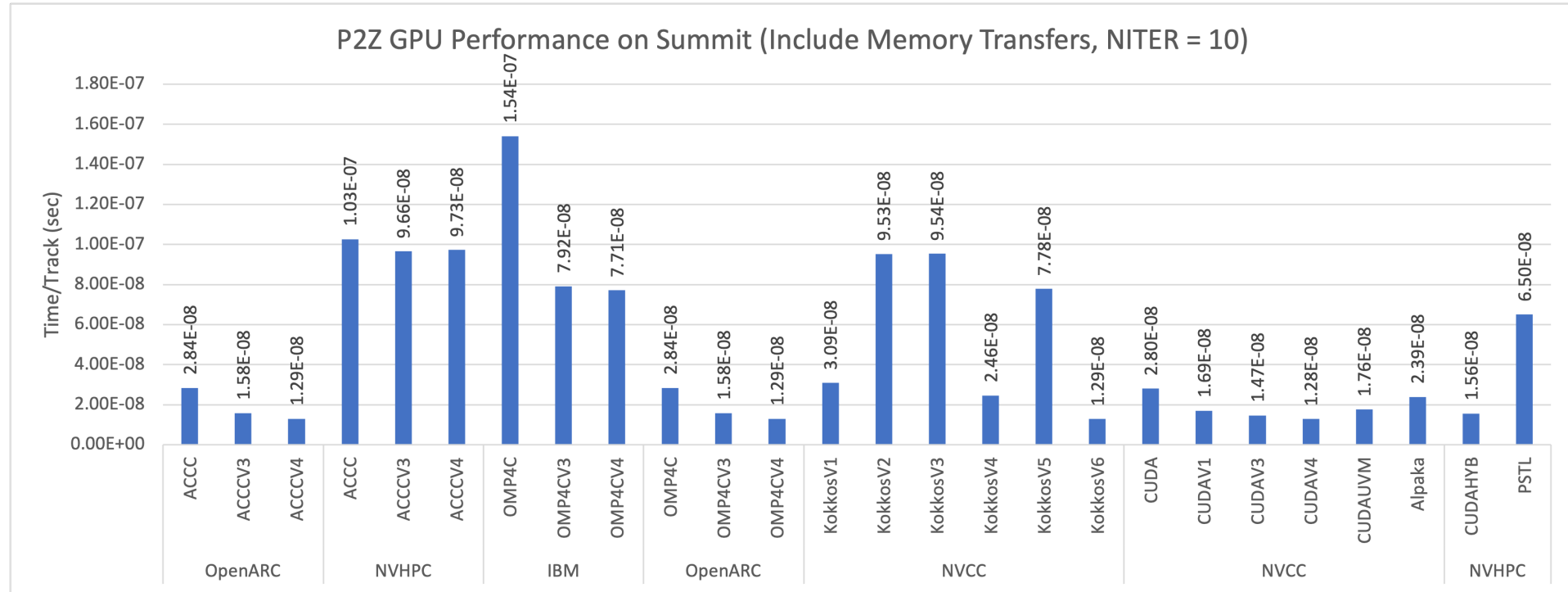


GPU Performance of P2Z on Summit (All)



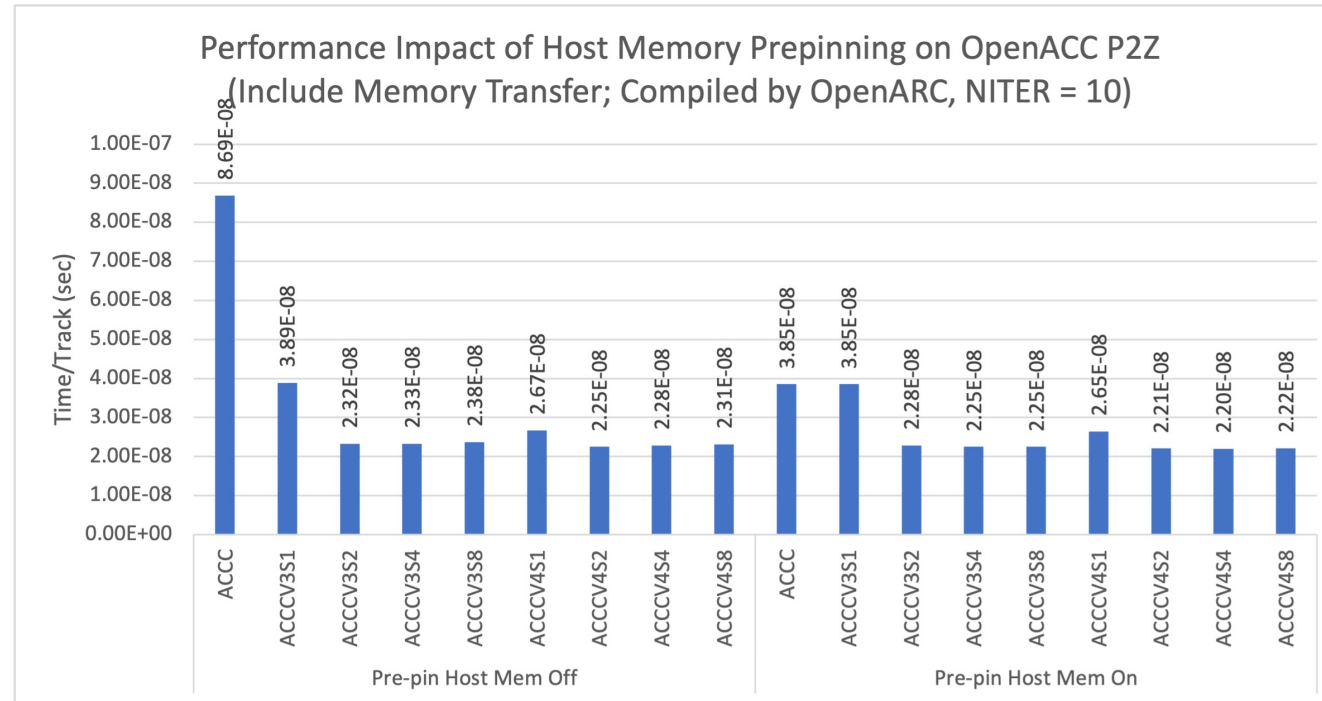
- Array-Of-Structures-Of-Arrays (AOSOA), UVM (repeated prefetch), Batched shared data on Shared Memory, Async: CUDA
- AOSOA, UVM (repeated prefetch), Thread-private data on Local Memory, Async: CUDAV1, CUDAUVM (C++)
- AOSOA, Batched shared data on Local Memory, Async: CUDAV2
- AOSOA, Batched shared data on Shared Memory, Async: CUDAV3, ACCCV3, OMP4CV3, KokkosV3 (single default stream), KokkosV4 (pre-pin, multi-streams), Alpaka
- AOSOA, Batched shared data on Shared Memory, Sync: ACCC, OMP4C
- AOSOA, Thread-private data on Local Memory, Async: CUDAV4, CUDAHYB, PSTL, ACCCV4, OMP4CV4, KokkosV5 (single default stream), KokkosV6 (pre-pin, multi-streams)
- Structure-Of-Arrays (SOA), UVM (no prefetch), Batched shared data on Shared Memory, Async (single default stream): KokkosV1
- SOA, Batched shared data on Shared Memory, Async (single default stream): KokkosV2
- All OpenARC-compiled OpenACC/OpenMP4 versions are explicitly pre-pinned.
- All asynchronous versions except for KokkosV3 and KokkosV5 use 10 streams.

GPU Performance of P2Z on Summit (Subset)



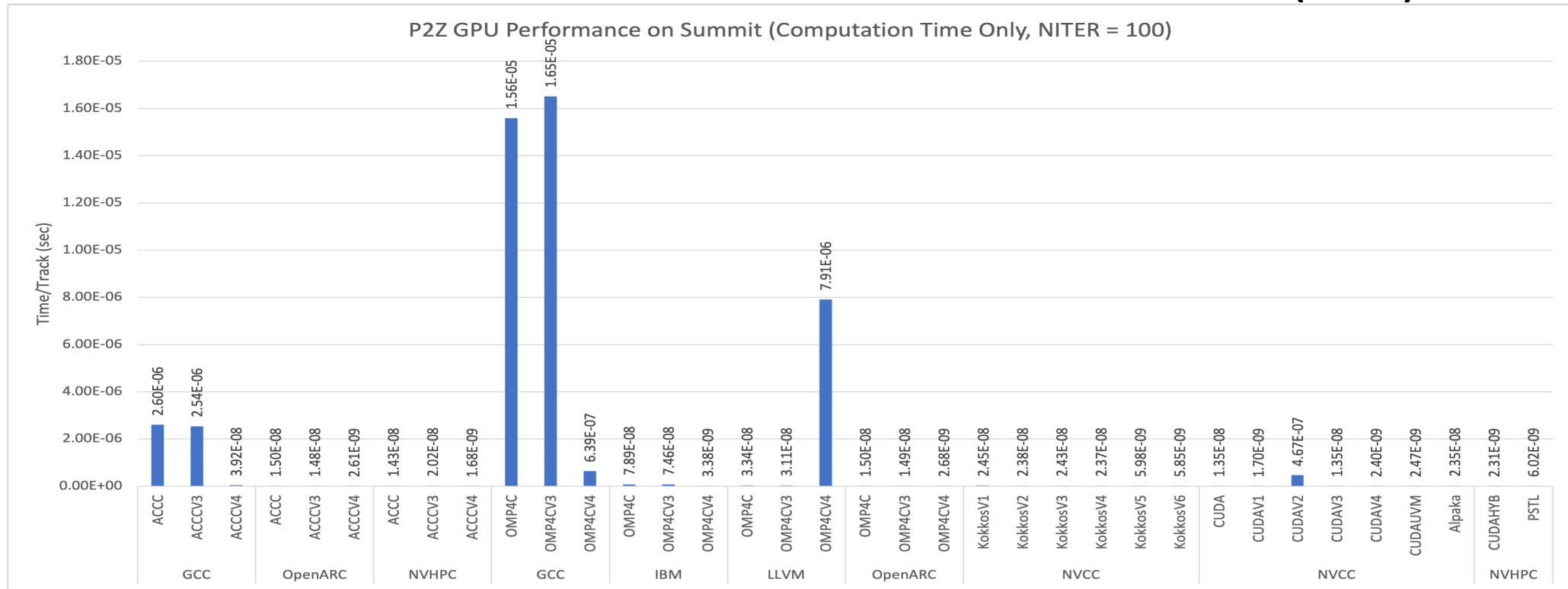
- Array-Of-Structures-Of-Arrays (AOSOA), UVM (repeated prefetch), Batched shared data on Shared Memory, Async: CUDA
- AOSOA, UVM (repeated prefetch), Thread-private data on Local Memory, Async: CUDA V1, CUDA UVM (C++)
- AOSOA, Batched shared data on Local Memory, Async: CUDA V2
- AOSOA, Batched shared data on Shared Memory, Async: CUDA V3, ACCCV3, OMP4CV3, KokkosV3 (single default stream), KokkosV4 (pre-pin, multi-streams), Alpaka
- AOSOA, Batched shared data on Shared Memory, Sync: ACCC, OMP4C
- AOSOA, Thread-private data on Local Memory, Async: CUDA V4, CUDA HYB, PSTL, ACCCV4, OMP4CV4, KokkosV5 (single default stream), KokkosV6 (pre-pin, multi-streams)
- Structure-Of-Arrays (SOA), UVM (no prefetch), Batched shared data on Shared Memory, Async (single default stream): KokkosV1
- SOA, Batched shared data on Shared Memory, Async (single default stream): KokkosV2
- All OpenARC-compiled OpenACC/OpenMP4 versions are explicitly pre-pinned.
- All asynchronous versions except for KokkosV3 and KokkosV5 use 10 streams.

Performance Impact of Host-Memory Pre-pinning on OpenACC P2Z



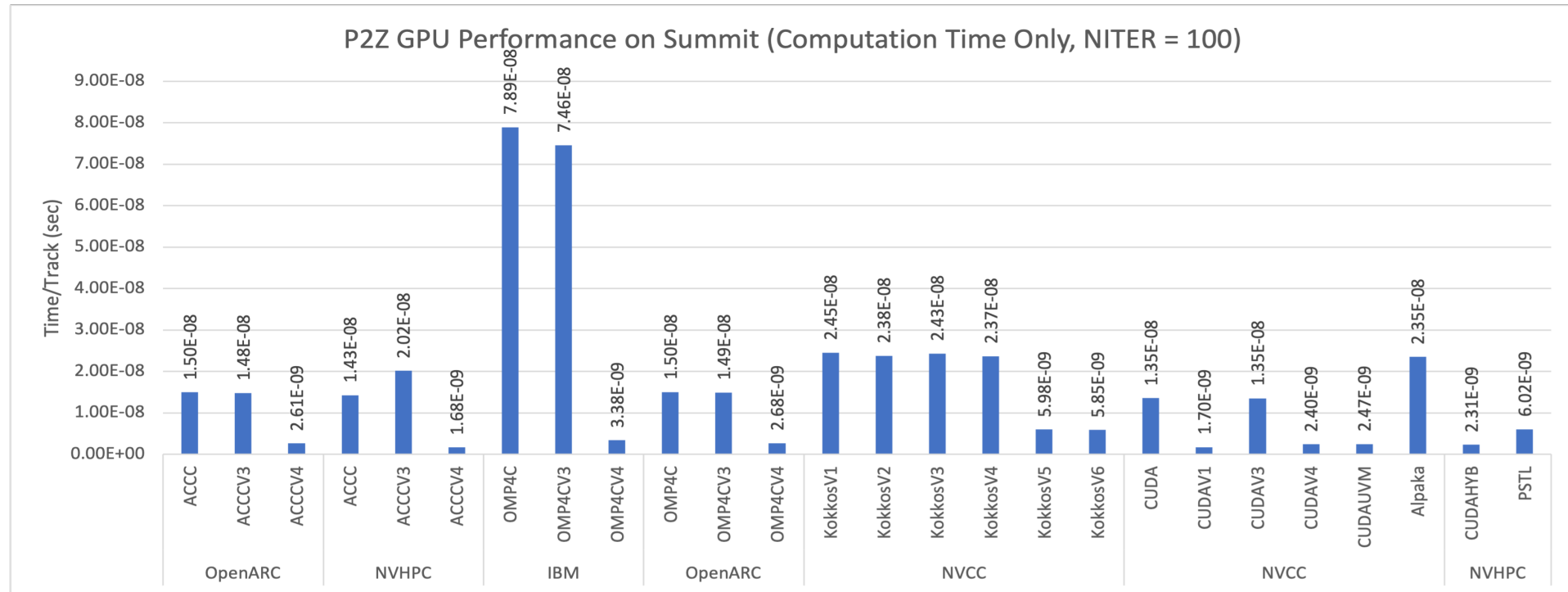
- ACCC: AOSOA, Batched shared data on Shared Memory, Sync
- ACCCV3: AOSOA, Batched shared data on Shared Memory, Async
- ACCCV4: AOSOA, Thread-private data on Local Memory, Async
- When Host-Memory-Pre-pinning is on, all the host data appearing on OpenACC data clauses are pre-pinned.
- All asynchronous versions pre-pin the host memory before each asynchronous memory transfer if it is not already pre-pinned (on-demand host-memory pre-pinning)

GPU Performance of P2Z on Summit (All)



- Array-Of-Structures-Of-Arrays (AOSOA), UVM, Batched shared data on Shared Memory, Async: CUDA
- AOSOA, UVM, Thread-private data on Local Memory, Async: CUDAV1, CUDAUVM (C++)
- AOSOA, Batched shared data on Local Memory, Async: CUDAV2
- AOSOA, Batched shared data on Shared Memory, Async: CUDAV3, ACCCV3, OMP4CV3, KokkosV3 (single default stream), KokkosV4 (pre-pin, multi-streams) , Alpaka
- AOSOA, Batched shared data on Shared Memory, Sync: ACCC, OMP4C
- AOSOA, Thread-private data on Local Memory, Async: CUDAV4, CUDAHYB, PSTL, ACCCV4, OMP4CV4 , KokkosV5 (single default stream), KokkosV6 (pre-pin, multi-streams)
- Structure-Of-Arrays (SOA), UVM, Batched shared data on Shared Memory, Async (single default stream): KokkosV1
- SOA, Batched shared data on Shared Memory, Async (single default stream): KokkosV2
- All OpenARC-compiled OpenACC/OpenMP4 versions are explicitly pre-pinned.
- All asynchronous versions except for KokkosV3 and KokkosV5 use 10 streams.

GPU Performance of P2Z on Summit (Subset)



- Array-Of-Structures-Of-Arrays (AOSOA), UVM, Batched shared data on Shared Memory, Async: CUDA
- AOSOA, UVM, Thread-private data on Local Memory, Async: CUDAV1, CUDAUVM (C++)
- AOSOA, Batched shared data on Local Memory, Async: CUDAV2
- AOSOA, Batched shared data on Shared Memory, Async: CUDAV3, ACCCV3, OMP4CV3, KokkosV3 (single default stream), KokkosV4 (pre-pin, multi-streams) , Alpaka
- AOSOA, Batched shared data on Shared Memory, Sync: ACCC, OMP4C
- AOSOA, Thread-private data on Local Memory, Async: CUDAV4, CUDAHYB, PSTL, ACCCV4, OMP4CV4 , KokkosV5 (single default stream), KokkosV6 (pre-pin, multi-streams)
- Structure-Of-Arrays (SOA), UVM, Batched shared data on Shared Memory, Async (single default stream): KokkosV1
- SOA, Batched shared data on Shared Memory, Async (single default stream): KokkosV2
- All OpenARC-compiled OpenACC/OpenMP4 versions are explicitly pre-pinned.
- All asynchronous versions except for KokkosV3 and KokkosV5 use 10 streams.